

Indoor Radon Monitoring and Gamma Activity Levels Inside Some Ancient Egyptian Tombs in Luxor

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Abstract

In the present work, radon concentrations in five selected tombs in the valley of kings, Luxor city, have been evaluated utilizing a portable radon monitor RTM 1688-2, SARAD. Additionally, specific radioactivity concentrations of the radionuclides ^{226}Ra , ^{232}Th and ^{40}K in the samples taken from the selected tombs showing results lower than the average international radioactivity levels. Seasonal variations of radon concentration have been observed, with high summer average radon concentration values at the tomb of RAMESES II SONS *MX"7+"qh"cdqwy"8587"Ö"3;2"Ds0o/5hqt"vjg"vqodou"kppgt"ejcodgt"cpf"7733"Ö" 276 Bq.m-3 for the tomb's middle chamber. The highest winter average radon concentration was observed at RAMESES VI tomb (KV9) with a value of 491 Ö"38"Ds0o/50"Vjg"vqwt"iwkfgu"ctg""hqwpf"vq"gzrqug"vq"cp"cxgcticg""cuuqekcvgf""cppwcn"" effective doses ranging from 0.360 to 14.592 mSv.y-1 and the visitors from 0.001 to 0.029 mSv.y-1 while the corresponding results for workers ranging from 3.455 to 140.081 mSv.y-1 which exceed the world lower recommended level (3-10 mSv.y-1). Accordingly, to avoid the health hazards associated with the exposure to radon during the long period of work inside these tombs, proposed solutions are introduced.

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